An improved laser transmitter using feedforward linearization technique for radio over fiber communication system

Abstract

Several linearization techniques such as predistortion, feedback, quasi feedforward and feedforward which have been proposed are suggested to improve the linearity of a laser transmitter specifically for Radio over Fibre communication system. In general, feedforward linearization technique is known to be more effective since it can achieve reduction in all orders of distortion for large bandwidth and high frequency without needing to know the nonlinear characteristics of lasers. In this paper, we propose an improved feedforward laser transmitter design. The theoretical study shows that the proposed design is less sensitive since the distortion suppression is influenced by fewer parameters compared to other reported works. The simulation results show that the proposed system can achieve the optimum distortion reduction around 30 dB by only adjusting the coupling coefficient of both optical couplers in the distortion cancellation loop, while the phase is matched and the signal is cancelled optimally in signal cancellation loop. Previous works based on feedforward linearization technique will also be reviewed through some papers and patents.